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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,907	04/25/2007	Toru Nishimura	0425-1253PUS1	7128

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EXAMINER	
QIAN, YUN	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/574,907	NISHIMURA ET AL.	
	Examiner	Art Unit	
	YUN QIAN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-10 and 12-16 remain for examination. Claims 1, 5 and 10 have been amended.

Claim 11 is previously canceled.

The drawings filed on April 25, 2007 are accepted by the Examiner.

Previous Grounds of Rejection

In the light of the amendment, the rejection under 35 U.S.C. 112(2) as lacks antecedent basis with respect to claims 1 and 10 are withdrawn.

Regarding claims 1-6 and 8-9, the rejection under 35 U.S.C.103 (a) as being unpatentable over Mizumoto et al (US 4,631,263) is amended as claims 1 and 5 are amended.

Regarding claim 7, the rejection under 35 U.S.C. 103(a) as being unpatentable over Mizumoto et al. as discussed above, in further view of Nishino et. al. (JP 55-149355) is amended as claims 1 and 5 are amended.

Regarding claims 10 and 12-16, the rejection under 35 U.S.C.103 (a) as being unpatentable over Yokota et al. (US 4,625,063) in view of Mizumoto et al (US 4,631,263) are amended as claims 10 is amended.

Amended Ground(s) Rejection

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 and 8-9 are rejected under 35 U.S.C.103 (a) as being unpatentable over Mizumoto et al (US 4,631,263).

Regarding claims 1 and 5, Mizumoto et al teaches a water-repellent catalyst comprising a catalytically active noble metal and a polytetrafluoroethylene carrier. The resulting catalyst can be cut into sheets (10 cm wide, 210 cm long). The catalytically

active component supported on at least one surface of the carrier (col.1, line 52, and col. 6, lines 9-10).

The thickness of catalytically active component taught by Mizumoto et al is from 50 μm to 50 Å, the gas permeability is not lost (col. 3, lines 35-39, and claim 3).

Mizumoto et al. states "when the water-repellent catalyst of this invention is used, it become possible that the gas passes not only over the surfaces of the catalyst but also through the **interior** of the catalyst and, accordingly, three-phase interfaces are easily formed, and the rate of reaction can be increased." (col.2, lines 27-32, emphases is added by Examiner).

Furthermore, as shown in the Fig.2, the catalytically active noble metal and the polytetrafluoroethylene carrier are in the three-dimensional network structure. Therefore, effectively utilizing the catalysts can be achieved.

Such water-repellent catalysts are used to wide range of gas/liquid reactions. Gas/liquid reactions include reactants consisting of gas and liquid and effect a chemical conversion between these reactants (col.2, lines 50-58). It meets the instant claimed limitation of the mass (i.e. gas) transfer between the inside and outside of the catalyst.

The ratio of the active metal to the total weight of carrier (synthetic resin, polytetrafluoroethylene) taught by Mizumoto is 0.1 to 10%wt (claim 1). Such ratio is considered to be a result effective variable because, it is well understood that the catalytic efficiencies is based on the surface area of the active metal, metal particle sizes and surface area of the support material. So the skilled artisan would have

determined the optimal amount of catalyst loading onto to the carrier, based on the above considerations though routine experimentation in the art. Particular in view of the fact that:

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Although Mizumoto et al. does not specifically disclose the pore volume (mL/m^2) of the catalyst 0.5 to 30 mL/m^2, he teaches the porous carrier (polytetrafluoroethylene) having a mean pore size of 0.1 to 10 μm and a porosity of 50 to 95% (claim 1).

Since the catalytically active component is coated on the outer surface of the support material, it would be obviousness that the particle sizes of the powdery catalysts are bigger than the pore volume of the supported carrier.

Regarding claims 2-3 as discussed above, the film-type catalyst taught by Mizumoto et al. comprises copper (noble metal), and have a thickness of 50 μm to 50 Å. It is fixed on the surface of a substrate (claim 3).

Regarding claims 4 and 8, since the film-type catalyst taught by Mizumoto et al. has a thickness from 50 um to 50 Å, it is considered a metal film is coated on the surface of another metal film (substrate) (col.4, lines 18-52, and Fig.5).

Regarding claims 6, Mizumoto et al discloses the carrier for the film-type catalyst comprising polytetrafluorothylene (thermosetting polymer) (col. 3, lines 5-19).

Regarding claim 9, the support members taught by Mizumoto et al. are metallic nets, such as a fine-wire net, a lattice form plate. It encompasses the instant claims (FIG. 5, col. 3, lines 52 to col.5, lines 25).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizumoto et al. as discussed above, in further view of Nishino et. al. (JP 55-149355).

Regarding claim 7, although Mizumoto et al. does not specially teach including a phenol resin as per applicant claim 7, Nishino et al teaches a process of making a phenol resin supported oxidation catalyst. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute polytetrafluorothylene of Mizumoto with phenol resin of Nishino. As both materials are equivalent used as catalyst support material, having good refractoriness, pertains excellent strength against compression force, it would have a reasonable expectation of success. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Claims 10 and 12-16 are rejected under 35 U.S.C.103 (a) as being unpatentable over Yokota et al. (US 4,625,063) in view of Mizumoto et al (US 4,631,263).

Regarding claims 10, Yokota et al. teaches a process of production a tertiary amine from an alcohol or an aldehyde and a primary or second amine, catalyzed by a powdery catalyst (the molar ratio of Cu: Ni: Ru=4:1:0.01) (Abstract, [0069] and claim 1).

However, Yokota et al. fails to teach further converting the powdery catalyst to a film-type catalyst as per applicant claim 10. Mizumoto et al teaches a method of making water-repellent catalyst by impregnating a solution of catalytically active noble metal with a polytetrafluoroethylene carrier. The resulting catalyst can be cut into sheets (10 cm wide, 210 cm long) (col. 6, lines 9-10).

The thickness of catalytically active component taught by Mizumoto et al is from 50 μm to 50 Å, the gas permeability is not lost (col. 3, lines 35-39, and claim 3).

Mizumoto et al. states "when the water-repellent catalyst of this invention is used, it become possible that the gas passes not only over the surfaces of the catalyst but also through the **interior** of the catalyst and, accordingly, three-phase interfaces are easily formed, and the rate of reaction can be increased." (col.2, lines 27-32, emphases is added by Examiner).

Furthermore, as shown in the Fig.2, the catalytically active noble metal and the polytetrafluoroethylene carrier are in the three-dimensional network structure. Therefore, effectively utilizing the catalysts can be achieved.

Such water-repellent catalysts are used to wide range of gas/liquid reactions. Gas/liquid reactions include reactants consisting of gas and liquid and effect a chemical

conversion between these reactants (col.2, lines 50-58). It meets the instant claimed limitation of the mass (i.e. gas) transfer between the inside and outside of the catalyst.

The ratio of the active metal to the total weight of carrier (synthetic resin, polytetrafluoroethylene) taught by Mizumoto is 0.1 to 10%wt (claim 1). Such ratio is considered to be a result effective variable because, it is well understood that the catalytic efficiencies is based on the surface area of the active metal, metal particle sizes and surface area of the support material. So the skilled artisan would have determined the optimal amount of catalyst loading onto to the carrier, based on the above considerations though routine experimentation in the art. Particular in view of the fact that:

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Although Mizumoto et al. does not specifically disclose the pore volume (mL/m^2) of the catalyst 0.5 to 30 mL/m^2, he teaches the porous carrier (polytetrafluoroethylene) having a mean pore size of 0.1 to 10 μm and a porosity of 50 to 95% (claim 1).

Since the catalytically active component is coated on the outer surface of the support material, it would be obviousness that the particle sizes of the powdery catalysts are bigger than the pore volume of the supported carrier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the film-type catalyst taught by Mizumoto et al. in the process of Yokota, motivated by the fact that Mizumoto et al. discloses that such catalysts provide improved gas (H_2) permeability and thus lead to better catalytic efficiencies (abstract, and col. 5, lines 15-16).

Regarding claims 12-13 as discussed above, the film-type catalyst taught by Mizumoto et al. comprises copper, and have a thickness of 50 um to 50 Å. It is fixed on the surface of a substrate (claim 3).

Regarding claims 14-15, since the film-type catalyst taught by Mizumoto et al. has a thickness from 50 μm to 50 Å, it is considered a metal film is coated on the surface of another metal film (substrate).

Regarding claim 16, the support members taught by Mizumoto et al. are metallic nets, such as a fine-wire net, a lattice form plate. It encompasses the instant claims (FIG. 5, col. 3, lines 52 to col.5, lines 25).

Response to Arguments

With regards to the previous Grounds of Rejection

Applicant's arguments filed on June 4, 2010 have been considered but are not persuasive. The examiner would like to take this opportunity to address the Applicant's arguments.

Applicant's argument that Mizumoto et al. fails to disclose that the interior of the catalyst can be used as sites for the reaction, and the instant application recites the

mass transfer between the inside and outside of the catalyst can be promoted thereby utilizing the whole of the catalyst (Remarks, pages 7-8).

The Examiner respectfully disagrees. The references fail to show certain features of applicant's invention, it is noted that the features, upon which applicant relies (i.e., sites for the reaction) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns,* 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

As discussed above, the water- repellent catalysts taught by Mizumoto et al also allow the mass transfer (i.e. a gas phase of reactant) between the inside and outside of the catalyst.

Applicants further argue the difference in thickness of the catalysts lead to very different results for the amination reaction. The film-type catalyst of the instant application can utilize the whole of the catalyst and simultaneously suppress the excessive reaction of the intermediate reaction product in the inside of the catalyst. This phenomenon is totally different from Mizumoto et al. (Remarks, page 9).

The Examiner respectfully submits the film-type catalyst taught by Mizumoto et al. have a thickness of 50 μm to 50 Å, which is encompassed by the instant application. If the gas passages and the liquid passages are separated from each other by using the water-repellent catalyst as diaphragms disclosed by Mizumoto et al., the entire surfaces of the catalyst can be utilized for established three-phase interfaces. Accordingly, there

is obtained an effect of enhancing the efficiency of the catalyst per unit weight (Col.4, lines 46-52).

Since the combined references teach the same composition and have a thinner thickness of film than the instant claims, the resulting catalyst would expect to be capable of performing high selectivity (suppress the excessive reaction of the intermediate reaction product). Therefore it meets the claim limitations.

As discussed above, the cited references disclose all of the claim limitations of independent claims 1 and 10, and those claims dependent thereon. Accordingly, the combination of references as a whole renders the present application obvious. The reason or rational that would allow one of ordinary skill in the art to arrive at the present application have been discussed above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YUN QIAN/
Examiner, Art Unit 1793

August 14, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793